
Are Condom Instructions Readable? Results of a Readability Study

GARY A. RICHWALD, MD, MPH
MARIA A. WAMSLEY
ANNE H. COULSON
DONALD E. MORISKY, ScD, MSPH

The authors are with the School of Public Health, University of California, Los Angeles. Dr. Richwald is an Assistant Professor, Division of Population and Family Health, Ms. Wamsley is a Research Associate, Ms. Coulson is a Senior Lecturer and Researcher in the Division of Epidemiology, and Dr. Morisky is an Associate Professor, Division of Behavioral Sciences and Health Education.

Tearsheet requests to Dr. Gary A. Richwald, Division of Population and Family Health, UCLA School of Public Health, Los Angeles, CA 90024.

Synopsis

The use of condoms has assumed a central position in the current strategy to prevent sexual

transmission of the human immunodeficiency virus. The effectiveness of condoms in disease prophylaxis is dependent, to a degree, on their correct use. Condom manufacturers routinely include information on condom use either printed on the actual package or in an enclosed package insert. With the use of three readability formulas, the reading grade level was determined for 14 different sets of instructions included with 25 brands of condoms manufactured by 7 domestic and 1 overseas manufacturer. The readability formulas, when applied to instructions for condom use, estimated that, conservatively, 8 of the 14 instructions required at least reading at the level of a high school graduate and none required less than a 10th grade level. Clearly written instructions and simple concepts could assist current and future condom users in the correct use of condoms and improve the effectiveness of condoms in the prevention of AIDS and other sexually transmitted diseases.

CONDOMS HAVE MOVED from a position of relative obscurity as contraceptives in the United States to a central position in the strategy for prevention of sexual transmission of the human immunodeficiency virus (HIV). Public health officials have called for the use of condoms to protect Americans from developing acquired immunodeficiency syndrome (AIDS) (1-3). Two recent literature reviews suggest that condoms reduce the sexual transmission of the AIDS virus (4,5), and a third review documents the efficacy and effectiveness of condoms in preventing other sexually transmitted diseases (6).

The actual effectiveness of condoms in disease prophylaxis depends on factors such as motivation, compliance, ability to negotiate use with another person, and the rate of mechanical failure. Effectiveness also reflects the degree to which they are used correctly (5,7). A number of authors have developed lists of instructions for condom users, in addition to those provided by condom manufacturers (8-11). Officials responsible for so-called AIDS "safer sex" campaigns have strongly recommended

that clear instructions for condom use be provided to users (12).

Although little is known about the nature of the relationship between the condom user's comprehension of instructions for use and the condom's effectiveness in preventing pregnancy or disease, such a relationship seems reasonable (13). One measure of the ability required to comprehend a health education message can be derived using readability formulas. These formulas use linguistic characteristics of the text, such as word and sentence length and difficulty of the vocabulary, in order to calculate an index of probable difficulty for readers (14). The number generated by these formulas should be interpreted as the reading grade level required to understand a passage fully. Readability testing has been used in the assessment of a variety of health consumer materials, including dental health education literature, human subject consent forms, and cancer detection-related messages (15-18). In this study, we used three different readability formulas to determine the reading grade level that a person must have

Table 1. Selected characteristics of condom instructions provided by manufacturers

| Manufacturer and brand | Number of sentences | Number of words | Mean number of words per sentence | Number of— | | |
|---|---------------------|-----------------|-----------------------------------|-------------------------|--|---|
| | | | | Syllables per 100 words | Polysyllabic words per sentence ¹ | Unfamiliar words per 100 words ² |
| <i>Ansell</i> | | | | | | |
| Conture, Nuda, } Stimula, Tahiti } | 9 | 115 | 12.8 | 160 | 1.8 | 29 |
| Lifestyles-Nuda Plus | 22 | 290 | 13.2 | 177 | 2.8 | 39 |
| Prime | 20 | 265 | 13.3 | 170 | 2.4 | 35 |
| <i>Carter-Wallace</i> | | | | | | |
| Trojan-Enz, Trojan-Enz } Lubricated, Trojan } Naturalube, Trojan } Plus, Trojan Ribbed } | 10 | 125 | 12.5 | 183 | 2.6 | 38 |
| <i>Circle Rubber</i> | | | | | | |
| Embrace Her, Pleaser | 18 | 286 | 15.9 | 162 | 2.1 | 32 |
| Saxon | 4 | 49 | 12.3 | 182 | 2.0 | 33 |
| <i>Fuji Latex</i> | | | | | | |
| Wrinkle Zero-0 #2000 | 7 | 122 | 17.4 | 176 | 2.7 | 28 |
| Yamabuki No. 1 | 8 | 144 | 18.0 | 154 | 1.6 | 22 |
| <i>Mentor</i> | | | | | | |
| Mentor | 22 | 332 | 15.1 | 168 | 2.8 | 28 |
| <i>National Sanitary</i> | | | | | | |
| Arouse | 18 | 246 | 13.7 | 182 | 3.1 | 35 |
| Contracept Plus | 12 | 146 | 12.2 | 177 | 2.4 | 34 |
| <i>Schmid</i> | | | | | | |
| Excita Extra, Ramses } Extra, Sheik Elite } | 24 | 368 | 15.3 | 173 | 3.0 | 38 |
| Ramses Nuform, Ramses } Sensitol Lubricated } | 14 | 186 | 13.3 | 191 | 3.4 | 43 |
| <i>VLI</i> | | | | | | |
| Today | 13 | 221 | 17.0 | 153 | 1.8 | 25 |

¹ Words with 3 or more syllables.² Words not found on the Dale-Chall word list.

reached to understand the instructions for use and other consumer information provided with condoms by condom manufacturers. This procedure then allowed us to determine the likelihood that condom users could understand these instructions.

Methods

In October 1987, 25 brands of condoms manufactured by 7 U.S. companies and 1 Japanese company were purchased at pharmacies located on the west side of Los Angeles (table 1). Readability testing was performed on the instructions for use, handling, and storage of condoms. These instructions were printed on the packaging materials or in separate package inserts. Promotional information was excluded from analysis. In all, 14 different text sequences were identified for the 25 brands of condoms. The entire text was included for study.

Readability was assessed in terms of reading grade level using three different methods. Although there are more than 40 readability formulas available, 3 methods were chosen because they are

among those most widely used, and each one addresses slightly different determinants of readability (15,17). The Dale-Chall Formula takes into consideration sentence length and the frequency of words not found on a list of 3,000 familiar words in determining the reading grade level (19-21). The Fry Readability Graph uses sentence length and number of syllables per 100 words to read the grade level score from a graph (22,23). The SMOG Grading Formula is based on the number of words with three or more syllables per sentence. It is the most frequently used method of readability testing and has been chosen by the Office of Cancer Communications of the National Cancer Institute for assessing its public and patient education materials (18,24). The standard error of the prediction is 1.5 years for the SMOG Formula and 0.8 years for the Dale-Chall Formula. No standard error was reported for the Fry Readability Graph (14).

Results

Table 1 shows the linguistic variables used in the readability formulas for each of the 14 different

Table 2. Reading grade level for condom instructions provided by manufacturers, determined by three methods of readability testing

| Manufacturer and brand | Reading grade level | | |
|--|---------------------|------|------|
| | Dale-Chall | Fry | SMOG |
| <i>Ansell</i> | | | |
| Conture, Nuda, Stimula, Tahiti | 11-12 | 10 | 10 |
| Lifestyles-Nuda Plus | 16-college graduate | 15 | 12 |
| Prime | 13-15 | 12 | 11 |
| <i>Carter-Wallace</i> | | | |
| Trojan-Enz, Trojan Lubricated, Trojan Naturalube, Trojan Plus, Trojan Ribbed) | 16-college graduate | 17 + | 12 |
| <i>Circle Rubber</i> | | | |
| Embrace Her, Pleaser | 13-15 | 11 | 11 |
| Saxon | 13-15 | 17 + | 11 |
| <i>Fuji Latex</i> | | | |
| Wrinkle Zero-0 #2000 | 11-12 | 15 + | 12 |
| Yamabuki No. 1 | 11-12 | 10 | 10 |
| <i>Mentor</i> | | | |
| Mentor | 11-12 | 13 | 12 |
| <i>National Sanitary</i> | | | |
| Arouse | 13-15 | 17 + | 13 |
| Contracept Plus | 13-15 | 16 | 12 |
| <i>Schmid</i> | | | |
| Excita Extra, Ramses) | 16-college graduate | 14 | 12 |
| Extra, Sheik Elite) | 16-college graduate | 17 + | 13 |
| Ramses Nuform, Ramses) | 16-college graduate | 17 + | 13 |
| Sensitol Lubricated) | 16-college graduate | 17 + | 13 |
| <i>VLI</i> | | | |
| Today | 11-12 | 9 | 10 |

sets of condom instructions. The mean number of sentences was 14, with a range of 4 to 24; the mean number of words in the message was 207, with a range of 49 to 368. The mean sentence length was 14.4 words with a standard deviation (SD) of 1.9. There were an average of 172 syllables (range: 153-191) for every 100 words (SD = 11). There was a twofold variation in the number of polysyllabic words (3 or more syllables) per sentence, from 1.6 to 3.4 with a mean of 2.5 (SD = 0.5). On average, one-third (33) of every 100 words used could not be found on the 3,000 word Dale-Chall list of familiar words (SD = 6).

The three reading grade levels for each of the 14 sets of instructions can be found in table 2. Although the three methods of determining readability gave somewhat different results on these 14 texts, the correlations (rank difference) among them were significantly positive (Dale-Chall and Fry: .63, Fry and SMOG: .80, and Dale-Chall and SMOG: .62). The SMOG results indicated readability at a consistently lower level than the other two. Using this scale (SMOG) as the "best case," two of the texts would be effectively unreadable by

anyone whose reading skills are below those at the level of a college freshman. Six additional texts required reading skills at the level of a high school graduate, and none required less than a 10th grade level.

With the use of the Dale-Chall scale, only five texts were rated as low as 11th grade reading skills; only five texts had scores on the Fry indicating that high school level reading skills would be sufficient for understanding. If one examines the highest of the three scores for each condom ("worst case" analysis), all texts required at least the reading skills of a high school graduate.

Discussion

The results of the readability tests indicate that most brands of condoms have instructions for use and other user-related information that require at least some college level reading ability to comprehend them fully. Although national data on the U.S. population's reading level are unavailable, 1980 census data indicated that for Americans

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between 25 and 34, 13 percent of whites, 21 percent of blacks, and 42 percent of Hispanics had failed to complete high school (25). The grade of schooling completed, however, is an overestimation of the reading level due to difficulties in reading achievement (26). The results of the readability tests indicate that it would be difficult for many persons who use condoms to comprehend the written materials examined in this study. Inability to understand completely how to use condoms could result in a marked decrease in their effectiveness in preventing HIV infection and other sexually transmitted diseases, as well as pregnancy (5,6). This finding may be especially important for persons with poor reading skills, persons who are using the condom incorrectly, and persons who have had no prior experience using them. The latter group includes those who have been sexually active and are considering the use of condoms for the first time and those who are becoming sexually active and have not decided on a method other than condoms for birth control or disease prophylaxis or both.

However, readability formulas measure only the structural problems with written materials, such as word difficulty and sentence length. Characteristics of the reader, such as his or her interest and previous experience with condoms, and the actual content, organization, conceptual difficulty, and format of the text are not taken into account in readability formulas (18,27).

To address some of these factors, as well as readability, the authors designed a new set of instructions for condom use. These employ short sentences with relatively simple structure and as few polysyllabic words as possible, so that the reading grade levels are in the 5th to 10th grade

range. Copies of the instructions, Appendix A, are available from the authors.

Additional methods could be used to further reduce reading difficulty. These include a glossary of terms to define complex words (for example, contraceptive or sperm), parenthetical descriptors for scientific terms set off in parentheses, and further improvements in graphics and layout, including the use of large type size and color for highlighting to enhance legibility under the low light situations that may be common prior to condom use.

The proper use of condoms remains an important goal in the prevention of AIDS and other sexually transmitted diseases (28). Last year, the Food and Drug Administration (FDA) notified U.S. condom manufacturers, importers, and repackers of an "acceptable" set of minimum instructions for condom use (29, 30). These instructions were determined in this study to be more complex and less readable (for example, SMOG reading grade level = 12) than those we designed (29,30). However, the FDA instructions are meant to be guidelines, and as such, should not limit a manufacturer's ability to use simpler instructions without seeking additional approval from the FDA. According to a communication from the Center for Devices and Radiological Health, FDA, Rockville, dated April 14, 1988:

Condoms being introduced into the U.S. market for the first time must have FDA clearance for marketing if the labeling includes health claims because the claims make them 'medical devices.' For condoms marketed as a method of preventing the transmission of STDs, no additional clearance is necessary to change the labeling implementing the FDA labeling guidance. However, resubmission for clearance is necessary if a manufacturer claims that its condoms are better or stronger than other condoms, or that they are specifically designed for preventing the transmission of AIDS only.

It is critical to reach present and future condom users with information at the right level of detail and in a format and language that is effective in influencing behavior (4,31,32). Although there are many complex issues involved in getting people to use condoms, we should not allow problems with readability, especially when they can be addressed and corrected, to interfere with the practice of "safer sex."

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